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SYNCHAETA BICORNIS: A NEW ROTIFER FROM THE
BRACKISH WATERS OF LAKE PONTCHAR-
TRAIN, LOUISIANA

By J. C. SMITH

WITH PLATE

During the summer of 1902, while making some investigations on the microscopic life of Lake Pontchartrain, Louisiana, I took a large number of a species of rotifer which, on comparing with the known species of the genus *Synchaeta*, appeared to differ so much as to warrant it being placed as a new species. At that time, Mr. C. F. Rousselet had begun publishing his Monograph of the Genus *Synchaeta*¹ and had given notice that he would describe several new brackish-water species. In order to determine whether my take was one of his new species I sent him some preserved material. He recognized the rotifer as a distinctly new species and suggested "*bicornis*" as an appropriate specific name.

The body of this rotifer (fig. 1) is of the usual *Synchaeta* type, *i. e.*, cone-shaped; this shape, owing to the very elastic nature of the cuticula, is subject to considerable variation as to length and width. In its most extended form, it is sub-cylindrical, the dorsum being slightly convex and the ventral surface correspondingly concave. It diminishes gradually towards the foot which is short, bulky, and quite distinctly marked off from the body. This foot bears two small peg-shaped toes, which are usually well separated while the animal is in motion. The foot and toes can be retracted entirely within the body of the animal.

The head portion, or corona, is well extended as a convex curve, and on its summit and most ventral aspect has three small papillae, each bearing a tuft of cilia, above which are two pairs of tactile setae, the inner pair apparently connected with the ciliary wreath;

¹ Rousselet, C. F. The Genus *Synchaeta*: A Monographic Study, with descriptions of Five New Species. Journal of the Royal Micros. Society, 1902.

the outer lateral pair arising from heavy triangular processes. The setae pierce the processes and are evidently connected with the brain mass.

The auricles are of medium size and stand out at a right angle to the body when they are extended.

On the dorsal surface, some distance below the extended auricles, originate two very prominent horns, which are tubular prolongations of the cuticula (fig. 1). These horns extend directly forward and sometimes reach almost to the limit of the protruded corona. Seen from above (fig. 1) they appear as cones, but when viewed from the side when the animal is turning slowly and the head part is retracted, they are seen to be true horns with their apices curved downwards (fig. 2). These horns are always more or less wrinkled transversely and can be extended and retracted to a considerable degree. While they often reach almost to the limit of the extended head parts, as noted above, it is not unusual to see very large forms with horns quite small and very small forms with very long horns, so that it may be concluded that the length of the horns does not bear any close relation to the size of the animal.

The dorsal antenna is inconspicuous and is in its usual position. The lateral antennae, if present, are very obscure, for the most careful examination of very many living and dead animals failed to disclose their presence.

The brain mass bears three distinct red eyes—one cervical connected with two frontal by two very obvious (in the living animal) streams of red granules. The cervical eye, as a rule, is composed of two segments which are not always of equal size, and together with the frontal eyes, is surrounded by red granules which seem to be a continuation of the granular streams. This peculiarity of three eyes and their granular connections is shared with another brackish-water species, *S. littoralis* Rousselet and a marine species, *S. triophthalmus* Laut.

The large mastax corresponds in shape with that of most of the species, while the fulcrum rests on two distinctly striated V-shaped muscles. The muscles surrounding the trophi appear to be of a tougher consistency than the other muscles of the body, for it was with difficulty that these were sufficiently dissolved to get a fairly good view of the trophi.

Fig. 4 represents an outline camera drawing of the trophi, which

correspond closer to the *tremula* type, as figured by Weber,¹ than to any other.

The fulcrum is very long and knobbed at its free or lower end; each incus has five small teeth on its free edge. The manubria and their wing-like processes can be best understood by consulting fig. 4.

On the ventral side of the mastax were found what appeared to be a pair of densely nucleated salivary glands, which were seen only while manipulating the isolated mastax.

The non-ciliated oesophagus is long and narrow and originates well up on the dorsal surface of the mastax. The stomach, when not unduly distended by food, is longish and ends in an intestine which is quite distinct.

The stomach has the usual gastric glands attached. The ovary offers nothing characteristic of this species. The lateral or excretory canals extend upward to a short distance above the summit of the gastric glands, a peculiarity which seems to be characteristic of all the Synchaetae. Excepting a small portion above the glands, they are obscured by the ovary and distended stomach. The usual turnings seem to be absent. There are three or four flame cells on each canal, which are not indicated in the figure. The contractile vesicle is of medium size and normal in position. The two foot-glands are elongate and distinct.

Many of the muscles are distinctly striated and a few muscle-fibrils are to be seen extending longitudinally through the horns.

This little creature is very transparent, the only color seen being that of the stomach contents, which is usually yellow or golden. In this connection, it is probably worthy of mention that all the rotifers of this species taken in July, 1902, were ornamented in a peculiar manner. Purplish spots of irregular shapes and sizes were distributed over the muscles, brain, and all other internal organs, the cuticula being free from them. Even the foot-glands and muscle-fibrils of the horns were affected. The color of the eyes was modified by what appeared to be layers of this colored matter. Nothing in the water in which these rotifers were taken could be correlated with these spots.

It is an exceedingly graceful animal in its movements, swimming in a straight line, revolving on its long axis at the same time and

¹ Weber, E. F. Faune Rotatorienne du Bassin du Léman. Revue suisse de Zoologie, t. 5, 1898.

turning abruptly from side to side. It has a habit of stopping suddenly without any apparent cause, and retracting completely within the body its head, foot, and toes and extending and approximating its horns. It remains in this curious condition (fig. 3) for a second or two, when it again resumes its active state and starts off on its mad chase. Another habit, which was noticed only when the cover-glass was used, is that of "standing on its head"—*i. e.*, it fixes its head to the cover-glass or slip while its body stands out at a right angle.

These delicate animals, so accustomed to the rough water of the lake, seem to be very susceptible to change of conditions, as they perish soon after being transferred to quiet water, for four hours after being taken but a small proportion were found still alive and active, making it necessary to examine them soon after being captured. They vary much in size; measuring when alive and fully extended from 200 microns to 300 microns long and from 100 microns to 150 microns wide across the extended auricles.

The oval egg is carried for a long time on the foot of the animal.

Lake Pontchartrain is a large body of water in southern Louisiana and drains a considerable area. It is about 40 miles long with a maximum width of about 25 miles and its greatest depth is about 18 feet. It connects with Lake Borgne and this again opens into the Gulf of Mexico. It is the waters from the Gulf which make the waters of both these lakes constantly brackish. The specific gravity of the water of Lake Pontchartrain during these investigations varied from 1.006 to 1.010. The rotifers were taken from the upper strata in water varying in depth from three to eight feet and from one to two miles from shore and over a course of six miles. At no time were any found in less depth than three feet and never near shore or among algae or floating debris. They may therefore be classed as belonging to the limnetic fauna.

They were first taken in July, 1902, and were then very abundant. They continued to diminish in numbers until November, when they disappeared entirely. In 1903 they first made their appearance in May, were again found in abundance in July, when they again began to diminish and finally disappeared in November.

The one characteristic which distinguishes *S. bicornis* from all other species of the genus is the two dorsal horns.

Mr. C. F. Rousselet, in his Monograph of the Genus *Synchaeta*,

has described sixteen species, of which seven are fresh-water forms, two brackish-water, and seven marine forms. *S. bicornis* will increase the brackish-water forms to three and the whole number of the genus to seventeen.

The following rotifers were found sparingly in company with *S. bicornis*: *Polyarthra platyptera*, *Anuraea curvicornis*, *Colurus amblytelus*, *Schizocerca diversicornis*, *Brachionus urceolaris*, *Monostyla bulla*, *Monostyla lunaris*, *Distyla gissensis*, and *Noteus quadricornis*.

Diatoms were represented by species of the following distinctly brackish and salt-water genera: *Coscinodiscus*, *Melosira*, *Biddulphia*, *Rhizosolenia*, *Chaetoceros*, *Terpsonia*, *Grammatophora*, *Suriella*, *Actinoptychus*, *Triceratium*, and others.

The Protozoa were represented by *Tintinnopsis beroidea* in great abundance, *Ceratium tripos*, and *C. furca*.

A copepod belonging to the genus *Acartia* was present in very large numbers.

EXPLANATION OF PLATE**Plate XVIII**

- Fig. 1. *Synchaeta bicornis* n. sp.
Fig. 2. Horns, viewed from side.
Fig. 3. Animal, still and with head, foot, and toes retracted and horns extended.
Fig. 4. Outline drawing of trophi.

PLATE XVIII

